



**The Impact of Debt on Firm Performance:
The moderating role of internationalization**

by

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A short biographical note on the author

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Abstract

Under the pressures of the recent global financial crisis, firms' capital decisions are questioned, and knowing how can debt help or harm growth and performance seems more relevant than ever. Supported on the main capital structure theories, such as the agency theory or the trade-off theory, that explain how companies decide on financing and how those decisions affect their results, this study examines the impact of debt on firms' performance under the moderating role of internationalization. Based on a sample of 2,244 Portuguese manufacturing firms and using a random effects model, results suggest that the type of international engagement can have a moderating effect on the relationship between debt and a company's performance. In particular, the results indicate that the impact of debt on the performance of companies involved in import activities is positive compared to companies without any international activity.

Keywords: Leverage, Debt, Capital structure, Firm performance, Internationalization.

JEL classification: F23 G32

Resumo

Pressionadas pela recente crise financeira global, as empresas são questionadas quanto a decisões de capital, e saber como a dívida pode incentivar ou travar o crescimento e a performance afigura-se mais relevante que nunca.

Com base nas principais teorias sobre a estrutura de capitais, como a teoria da agência ou a teoria de trade-off, que explicam como as empresas decidem sobre financiamento e como essas decisões afectam os seus resultados, este estudo examina o impacto da dívida na performance das empresas sob o efeito moderador da internacionalização. A partir de uma amostra de 2,244 indústrias portuguesas e usando um modelo de efeitos aleatórios, os resultados sugerem que o tipo de envolvimento internacional pode ter um efeito moderador na relação entre dívida e performance da empresa. Em particular, os resultados indicam que o impacto da dívida na performance de empresas envolvidas em actividades de importação é positivo, quando comparado com empresas sem qualquer actividade internacional.

Palavras-chave: Dívida, Estrutura de capital, Performance, Internacionalização.

Classificação JEL: F23 G32

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1. Introduction

Corporate financing decisions have long been under scrutiny in the main theoretical literature on capital structure and corporate finance (Jermias, 2008). Today, in the aftermath of the global financial crisis, and considering the new challenges it has imposed on most western economies, analyzing the effect of debt on a firm's performance seems not only relevant but needed.

Following the work of Modigliani and Miller (1958) who stated that debt is irrelevant for companies' value in a perfect capital market (and therefore irrelevant for performance), Jensen and Meckling (1976) presented a contrasting view - the agency theory - which, according to Dessi and Robertson (2003, p. 903), "*highlights the potential role of debt as a mechanism to mitigate conflicts between managers and shareholders*". This is based on the assumption that companies with free cash flow will face more conflicts between shareholders and managers: managers want more resources under their control and shareholders wish for more dividends. In order to keep managers from investing unproductively or wasting money elsewhere, the agency theory predicts that debt will act as a disciplining device and control mechanism for otherwise free riding managers - debt will reduce agency costs resulting in a positive effect on the company's performance (Jermias, 2008). The theory also considers conflicts between shareholders and debtholders, as the latter want less dividends and the guarantee that debt will be paid-off (Easterbrook, 1984). In this case, the theory focuses on the negative effect of debt on performance due to increased agency costs as a result of shareholders and debtholders' conflicts.

Shyam-Sunder and Myers (1999, p.219) assert that "*the theory of capital structure has been dominated by the search for optimal capital structure*" and, according to the trade-off theory, this optimal amount of debt will be defined by the trade-off companies must consider between fiscal benefits and the risk of financial constraint and bankruptcy (Myers, 1984). Introducing the concept of "*moderate borrowing by tax paying firms*" (Myers, 2001, p.81), the theory predicts that when reaching that optimum level of debt the firm's value will be maximized; if, however, the company exceeds the optimum debt level, costs and benefits will cease to be balanced

and the firm's market value will decrease, which can be translated into a negative impact on performance (Myers, 2001).

Myers and Majluf (1984)'s pecking order theory brought new light to the debate that followed Modigliani and Miller's irrelevance proposition, by taking into consideration asymmetric information between managers and outside investors to further understand why companies choose different debt levels, beyond the motivations of debt's optimal level. Their core assumption is that companies will tend to prefer internal to external financing, and when external financing is required, they will choose debt before issuing shares and entering the stock market (Myers, 1984). The fact that companies will exhaust internal sources of financing before contracting debt implies a negative correlation between debt and performance (Campello, 2006).

As evidenced above, theories on capital structure justify either a negative effect or a positive effect of debt on a firm's performance. When it comes to empirically testing the impact of debt on performance, consensus is also not evident. In fact, some authors (e.g. Dessi and Robertson, 2003; Abor, 2005; Margaritis and Psillaki, 2010; Tsuruta, 2015) confirm a positive relationship between debt and performance, while others (e.g. Rajan and Zingales, 1995; Giroud, Stomper and Westerkamp, 2011; González, 2013) find the opposite effect.

Recently, Vithessonthi and Tongurai (2015) introduced the exporting nature of the firm as a moderating factor of the impact of debt on a firm's performance. By studying the impact of debt on a sample of Thai companies, and distinguishing those who engage in international activities (without differentiating imports from exports), from those who only operate at the domestic level, the authors found that debt has a negative impact on performance when considering the total sample of companies, but a positive effect once only international-oriented firms are analyzed.

Although capital structure and performance have been comprehensively studied in the last decades, little seems to be said about the influence of the international nature of the firm when trying to measure the impact of debt on a firm's performance. To the best of our knowledge, only Vithessonthi and Tongurai (2015) address this issue. In that sense, our work aims at evaluating the impact of debt on performance in Portuguese companies comparing four main types of firms: the domestic, the importing, the exporting, and those that are both importing and exporting companies.

The importance of this choice lies in three main reasons: first, a big emphasis has been put on companies' financial decisions, and especially on debt overhang as a risk systemic factor - in Portugal, in 2008, the ratio of non-financial corporate debt to national GDP was 130% (Farinha and Félix, 2015); second, Portuguese entrepreneurs are highly dependent on external financing and they have faced severe restrictions to bank credit in recent years (Farinha and Félix, 2015); at the same time, when confronted with domestic markets in contraction, in the midst of a crisis, companies tend to turn to internationalization as a solution to expand their market (Poulakidas *et al.*, 2013), and so this makes Portuguese companies a particularly interesting base of analysis, even for further application to other similar European countries; finally, we propose to extend Vithessonthi and Tongurai's (2015) work by further segmenting the internationalization factor and dividing domestic, import, export and import-export companies.

At the end of our study, our goal is to answer the following research question:

Does firms' type of international involvement influence the impact of debt on their performance?

The present work is organized as follows: Section 2 analyzes the theoretical background of capital structure and firm performance, and after a brief overview of business internationalization literature, concludes with a review of the empirical literature on the relationship between debt and firm performance. Section 3 introduces the methodology, including the study's hypothesis and a short descriptive analysis. Section 4 estimates the model and discusses the results. Finally, Section 5 concludes.

2. Literature review

In order to further comprehend the theoretical background of debt and performance's relationship, in the remainder of this section we will introduce the concept and measures of performance, as well as the concept and measures of debt (section 2.1.1. and 2.1.2., respectively). We will then review the main corporate finance theories related to capital structure decisions and performance (section 2.1.3.) and conclude with a brief consideration of the internationalization business literature (section 2.1.4.). Finally, we will analyze empirical studies and their main results when testing the impact of debt on firm performance (section 2.2.).

2.1. Theoretical Background

2.1.1. *Concept and measures of performance*

Defining and measuring performance is quite complex, but from a financial point of view, one can assert it is mostly related to efficiency, profit and growth (Murphy, Trailer, and Hill, 1996). Many authors refer to a multi-disciplinary measurement of performance, one that includes not only financial indicators but also operating, functional and organizational long-term indicators (Chenhall and Langfield-Smith, 2007).

According to Santos and Brito (2012), firm performance should be distinguished from organizational effectiveness: while the latter relates to the broader values and functioning of the company, the first is focused on operational and financial outcomes.

Santos and Brito (2012) also recognize the need for a multidimensional measurement of performance and based on the stakeholder theory, which associates performance to meeting and measuring stakeholder's satisfaction, propose a model with first and second-order dimensions (so that it considers not only profitability, growth, and market value, but also customer satisfaction, employee satisfaction, social performance, and environmental performance) (Santos and Brito, 2012).

The main categories of performance measurement consist of accounting measures, operational measures, market-based measures, and survival measures (Carton and Hofer, 2006). For the purpose of our study, we will not focus on operational measures (which relate to customer satisfaction, human resources and other non-financial areas)

nor on survival measures (which analyze the duration of the business) (Carton and Hofer, 2006). We will focus on the distinction between accounting-based measures and market-based measures: while the first consist of financial data that basically translates profitability, such as the return on assets (ROA) or on investment (ROI), the latter relate more to expected performance and efficiency (for instance Tobin's Q and Market-Value Added –MVA) (Al-Matari, Al-Swidi and Fadzil, 2014).

Accounting-based measures focus on management's success and look at financial ratios regarding profits, sales and returns. Although generally preferred, but mainly based on accounting practices, they are often questioned for being only partially accurate, and limited in predicting future trends, as they tend to look backwards (Al-Matari et al, 2014).

Market-based measures, on the other hand, focus more on investor's perceptions and are commonly associated to exogenous elements, instead of management decisions. By associating external value to the company's assets, they tend to look forward and try to predict future performance (Tobin Q's is a good example, as it indicates expected long-run performance) and revenues (Al-Matari et al, 2014).

Measuring a company's efficiency and effectiveness is to assess the point where the firm is at, comparing to where it wants to go (present results compared to future goals) (Al-Matari et al, 2014). Despite the importance of a coherent set of measures of firm performance, that allow cross-comparisons over certain periods of time, and of the researchers' efforts to determine those measures, consistency in the literature has not so far been achieved (Santos and Brito, 2012).

With regard to the most commonly used performance measure, back in 1996, Murphy *et al.* (1996) had analyzed measures of performance in 51 entrepreneurship studies between 1987 and 1993. They had found that most studies do not use all of them, and reinforced that *"in order to compare performance among businesses, a common ground must be established"* (Murphy *et al.*, 1996, p.17). Other studies followed, and Table 1 summarizes the measures of performance that were identified in some of them as being the most used in a sample of articles: firstly by Murphy *et al.* (1996), secondly by Combs, Crook and Shook (2008) (who analyzed 374 articles from the Strategic Management Journal from 1980 to 2004) and finally by Al-Matari *et al.* (2014) (who analyzed studies from 1996 to 2014). Since each article may use more

than one measure of performance, all cited authors express their results in terms of frequency, that is, they analyze how many times that measure was used in the total sample of articles.

Table 1 - Measures of performance and frequency of measures.

| Nature of measure | Measure of Perf. | Freq. (Murphy <i>et al.</i> , 1996). | Freq. (Combs <i>et al.</i> , 2008). | Freq. (Al-Matari <i>et al.</i> , 2014). | Total |
|----------------------------------|--|--------------------------------------|-------------------------------------|---|-------|
| Accounting based measures | Change in sales | 23 | 38 | 3 | 64 |
| | Sales | 13 | 1 | 0 | 14 |
| | Return on Investment (ROI) | 13 | 15 | 1 | 29 |
| | Return on equity (ROE) | 9 | 26 | 52 | 87 |
| | Return on assets (ROA) | 9 | 64 | 88 | 161 |
| | Return on revenues (ROR) | 6 | n.a | 1 | 7 |
| | Return on sales (ROS)/ Net profit margin | 19 | 34 | 9 | 62 |
| | Gross Profit margin | 7 | 10 | 15 | 32 |
| Market based measures | Tobin's Q | 0 | 15 | 74 | 89 |
| Other | Other | 0 | 182 | 43 | 225 |
| Total | | 198 | 385 | 286 | 770 |

Source: Own elaboration based on Murphy *et al.* (1996, p.17), Combs *et al.* (2008, p.269) and Al-Matari *et al.* (2014, p.31).

In spite of the risk of duplication, as Combs *et al.*'s (2008) time period partially overlaps with Al Matari *et al.*'s (2014) and Murphy *et al.*'s (1996), Table 1 allows us to confirm that measures of performance in the literature differ substantially. Within the accounting based measures, if until 1993, and according to Murphy *et al.* (1996), *Change in Sales* was preferred by authors (12 % of total observations), in recent years it is the *Return on Assets* that seems to be preferred, representing respectively 31% and 17% of Al-Matari *et al.*'s (2014) and Comb *et al.*'s (2008) total observations.

Excluding "Other", which in Combs *et al* (2008)' study contains measures such as product quality, customer satisfaction, market share and export sales, for these authors (2008) Sales growth (Change in Sales) took second place (10% of total observations). As for Murphy *et al.* (1996), the second most used measure was the Return on Sales

(ROS), representing 9.6 % of the study's total sample, and for Al-Matari *et al.* (2014), it was the Tobin's Q measure of expected performance (26 % of the total sample). In fact, with respect to market based measures, Tobin's Q was for all periods the most used measure of performance.

According to Table 1, efficiency and growth were evidently the most important dimensions considered when analyzing performance, and, as verified by Murphy *et al.* (1996), they were mainly of accounting nature.

2.1.2. *Concept and measures of debt*

Companies tend to resort to both internal and external means of financing, and one can say that, in broader terms, debt is created when agents' consumption or investment exceeds their income, which is then complemented with borrowed financial resources (Foncerrada, 2005).

Central to corporate finance literature, debt is often studied as the dependent or independent variable, as authors try to understand changes in corporate debt. But like performance, measuring debt has no universal standard, and most researchers end up choosing whatever measure seems to be preferred by the majority of the preceding studies (Welch, 2011).

Welch (2011) reports that, from a superficial analysis, about half of recent studies on corporate finance define debt as the ratio between financial debt and total assets. Debt can be divided according to the maturity of capital. In this way, Abor (2005) considers three types of debt: short term debt, long term debt and total debt. Additionally, the level of debt is usually determined depending on the company size, so debt is measured using debt ratios, such as debt over equity or debt over total assets (whether short term, long term or total debt).

2.1.3. *Capital Structure and performance*

When summarizing capital structure literature, Myers (2001) distinguishes four main contributions: the trade-off theory, the pecking order theory, the free cash flow theory (or agency theory) and finally the Modigliani and Miller's irrelevance proposition. Although these seminal theories focus on capital structure decisions, more than on performance, through their main insights we aim at understanding about the effect of corporate financial decisions, in particular debt, on firm performance.

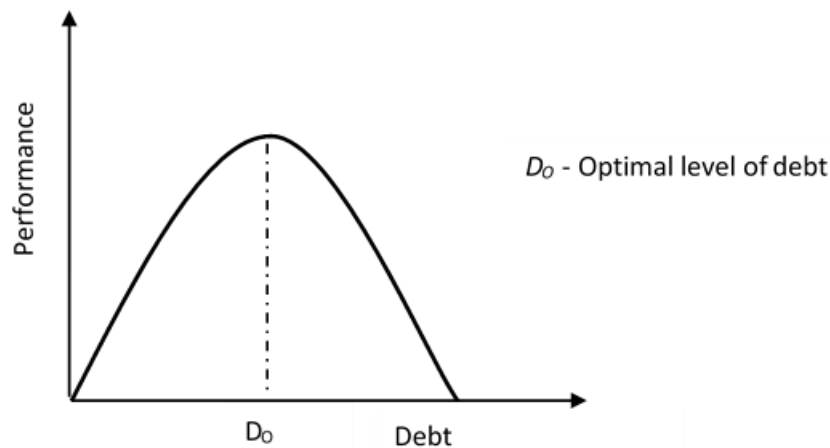
Modigliani and Miller (1958) first contributed to modern capital structure literature, giving what was later described as the most important insight into capital structure decisions (Myers, 1984). Among other contributions, they presented the capital structure irrelevance proposition, which states that in perfect markets, where the firm is a price taker, the financing mix of the company is irrelevant for its market value, and therefore for its performance (Myers, 1984).

Since then, numerous studies have been sustaining that debt does matter, especially when considering imperfect markets, and have been trying to grasp how that effect happens and why. But they have not reached the same conclusions.

According to Pinegar and Wilbricht (1989), the trade-off theory can be traced back to Kraus and Litzenberger (1973) who, based on Modigliani and Miller's (1958) irrelevance proposition, highlighted that *"the taxation of corporate profits and the existence of bankruptcy penalties are market imperfections that are central to a positive theory of the effect of leverage on the firm's market value."* (Kraus and Litzenberger, 1973, p. 911).

The trade-off theory perceives the firm as moving towards a defined target of a debt-to-value ratio (Myers, 1984) and, sustaining the concept of "moderate borrowing", it entails that the optimal debt ratio will be defined by the trade-off between the cost of debt and its benefits (mainly of fiscal nature), that is, the company will decide on debt pondering tax benefits against the risk of financial distress (Myers, 2001). We may so infer that debt will be positive for performance up to a certain point (where tax benefits overcome its costs), and from a certain point on the effect will be the opposite, that is, when benefits no longer compensate, debt will assume a negative role on performance. We are therefore facing an inverted u-shaped curve relation, as shown in Figure 1:

Figure 1 - The inverted U shaped curve of the trade-off theory of capital structure



Source: Own elaboration

As one can observe in Figure 1, the optimal level of debt (D_0) occurs when the value of the firm, measured in this case by its performance, is maximized by debt. Until the company reaches the optimal level of debt, an increase in debt leads to an increase in performance, but passing the optimal level, an increase in debt will lead to a decrease in performance. At the optimal level, marginal tax benefits are leveled by debt's marginal bankruptcy costs. In this sense, it is only natural that companies will try to target the optimal amount of debt, and therefore search for the most tax-rewarding type of debt (Hackbarth *et al.*, 2007).

Attributed to Myers and Majluf (1984), the pecking order theory argues that “*the firm will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures*” (Myers, 2001, p.81). Based on the notion of information asymmetry between managers and investors, the authors argue that companies will tend to opt for lower risk debt options: internal funds before debt, and debt before equity. By implying that profitable firms will exhaust internal funds before issuing debt, the pecking order theory suggests a negative impact of debt on performance. Hereof, Myers (1977) explains that debt overhang will make the company sacrifice valuable investments and opportunities that could ultimately contribute to the company's performance (Myers, 1977).

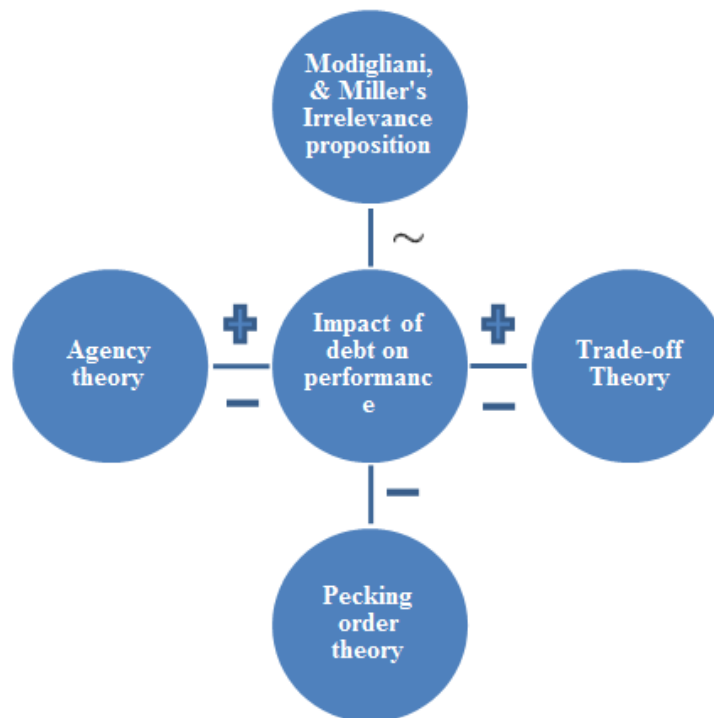
The agency theory of Jensen and Meckling (1976) has its foundations on the concept of agency costs, that is, the costs arising from conflicts between the agents: first and foremost between managers and shareholders, and at a second level, between shareholders and debtholders. On the one hand, in a management-focused approach, the agency cost theory highlights the positive effect of debt on performance (Jensen and Meckling, 1976). Under the free cash flow hypothesis (when companies have more profit than investment opportunities), managers will refrain from spending randomly in unproductive projects, because they have committed to those capital decisions and the company itself (Jensen, 1986). On the other hand, debtholders take on the risk of shareholder's investments, and because the latter tend to take maximum advantage of risk, debtholders try to limit dividends, while shareholders wish for the opposite outcome. The latent conflict and the creditors' need of controlling shareholders will generate costs for the company, namely through increased interest rates (Easterbrook, 1984).

Although the original theory as presented by Jensen and Meckling (1976) highlights the positive impact of debt on performance, focusing on management, it is nonetheless significant to consider that if a small increase in debt will be positive for performance by controlling manager's spending, debt may also lead to higher expected costs of bankruptcy and therefore result in higher interest rates as a mechanism for debtholders to minimize risk (Berger and Udell, 2006). In conclusion, even if the original theory focuses on the conflicting interests between managers and shareholders and on the positive impact of debt on performance, further exploration shows that it also considers the negative impact that debt can have on a company's performance when conflicts between shareholders and debtholders arise.

Overall, the main theories that were presented above differ on their insights regarding the impact of capital structure on performance, as shown on Figure 2: Modigliani and Miller's irrelevance proposition states that debt is irrelevant for the firm's market value and consequently for its performance; the trade-off theory shows that the impact of debt on performance will be positive only when reaching the optimal debt ratio (for the impact to be positive firms need to not overcome a level of moderate borrowing); the pecking order theory associates higher debt with worse performance and, finally, the agency cost theory advocates a mixed outcome, arguing for a possible

positive and negative impact of debt on performance through the refraining of managers' behavior, or the cost of shareholder's ambitions.

Figure 2 - The impact of debt on performance: main theoretical contributions



Source: Own elaboration

Having the divergent findings evidenced on Figure 2 as motivation, we will introduce internationalization as a third element to consider in the debt-performance relationship. It is therefore useful to understand how it has been positioned and discussed in the literature over the last years.

2.1.4. *Internationalization, performance and capital structure*

Evidently, other aspects besides debt affect firm performance, and internationalization is one of them. Johanson and Vahlne (1977) perceived internationalization as an incremental decision-making process from which the company was to gradually increase its international involvement: companies would tend

to start by exporting only sporadically, then export via agent, and then create foreign commercial subsidiaries before investing in foreign production (Johanson and Vahlne, 1977).

According to Kim, Hwang and Burgers (1993), the literature on international business shows that firms' participation in the global market provides them a number of opportunities that tend to contribute to a better firms' performance. Such opportunities are related to: the possibility of "*exploitation of economies of scale and scope above and beyond the potential of product diversification*"; the exposure of "*firms to multiple stimuli which provides firms with a broader learning opportunity and the ability to develop more diverse capabilities than are available to purely domestic firms*"; the gain of "*cost advantages by configuring their value-added chain*" in order to take advantage of different factor endowments of countries (Kim et al., 1993, p. 276).

Building on the positive effect of international involvement on performance, one of the main positive influences is knowledge, and in particular technological knowledge, which is acquired and accumulated in the internationalization process (Zahra, Ireland and Hitt, 2000). Also, internationalized companies will have a competitive advantage, by being forced to adapt to changing and challenging environments (Pinho, 2011). Through the process they will build "dynamic capabilities", advocated by Prange and Verdier (2011) as the secret for success, and define their ability to adapt their resources to different international settings (Sapienza *et al.*, 2006).

International diversification will not only allow companies to transfer core competencies between their business units and get ahead in building their competitive advantage, but also to minimize eventual damage in one market with the earnings of another market, hence providing lower transaction and capital costs (Jang and Tang, 2009). Multinationals can dislocate activities from country to country in search for lower costs and risk diffusion as well create economies of scale and explore asymmetries in international markets (De Noni and Apa, 2015). Also, research shows that internationalized companies have higher financial flexibility than their domestic counterparts (Singh and Hodder, 2000).

As stated by Vithessonthi and Tongurai (2015), interacting at the international level, either through the so-called "inward internationalization" (imports) or "outward

internationalization” (exports or FDI, for example), will provide stimulus and opportunities for the company to face and adapt to risk and error. From the lessons learned, companies will redefine strategies and reconfigure resources which will in turn provide incentives for growth and better performance.

To sum up, international business literature suggests a positive (direct) effect of internationalization on firm performance. Furthermore, Vithessonti and Tongurai (2015) expect for international-oriented firms to have better results on the debt-performance relationship. Two explanations are presented: on one hand, internationalized companies tend to have more tangible and intangible resources and higher accumulation of knowledge which allows them to achieve better performance; on the other hand, international-oriented firms may have more investment and growth opportunities than domestic-oriented ones, and therefore may more easily grow (Vithessonthi and Tongurai, 2015). Along these lines it is plausible to anticipate that the relationship between debt and a firm performance is different for these two types of companies (with or without international involvement). More specifically, Vithessonthi and Tongurai (2015, p. 268) advocate that *“the magnitude of the impact of leverage on firm performance should be larger for the international firms than for the domestic firms. The stronger such the effect of more profitable investment projects on firm performance is, the more it crowds out the negative effect of higher risks associated with such projects on firm performance”*.

In conclusion, in addition to the direct (positive) effect of internationalization on firm performance, an indirect positive effect of internationalization on the debt-performance relationship is also expected.

2.2. Empirical studies on the effect of debt and internationalization on performance

In what concerns the empirical testing of the impact of debt on performance, Table 2 indicates that there is an apparent lack of consistency in the literature. Table 2 summarizes the main empirical studies that test the impact of debt on a firm’s performance. From the keywords searched on “article title” for “leverage” *or* “debt” *and* “performance” *or* “profitability”, we extracted 109 articles from the Scopus database on February 2016. In August 2016, we extracted a new database from Scopus,

searching in “article Title” for “international” *or* “exports” *and* “debt” *or* “leverage, which resulted in 242 articles. After reading the abstracts and excluding all of those which do not attempt to test the impact of debt on performance, we came to the final 21 studies. Table 2 is focused on the author, country and period of analysis, sample and methodology. It also distinguishes the underlying theoretical background on which the studies base their analysis and the measures of performance and debt used. Finally, the table summarizes the impact of debt on performance presented by the authors. Studies are organized according to the impact signal (positive to negative), and, within each signal, by chronological order.

Studies vary in sample and country of analysis, as well as in time period. Some general traits can be identified: most studies accounting for a positive impact of debt on performance have as underlying theory the agency cost theory. On the other hand, studies that have found a negative impact of debt on performance often focus on developing countries (namely stressing a higher cost of debt) or on a crisis-context. Even so, the most relevant conclusion from analyzing Table 2 is that empirical results diverge; some authors find that debt has a positive impact on performance, others sustain a negative impact, and most of them present both results, positive and negative, under different conditions.

In 1996, Murphy *et al.* (1996) suggested that measures of performance are of ultimate importance because results vary according to the measure that is used in empirical studies. The authors found that the type of relationship between the independent variable and one measure of performance was not necessarily the same as with another measure of performance. In that sense, although recent studies confirm the trends identified in Table 1, that is, most studies use as accounting based measure the Return on Assets (ROA) and as market based measure the Tobin’s Q, differences can still be identified, and it is perhaps this use of different measures of performance that can explain some of the inconsistency found in the empirical studies analyzed.

When it comes to measuring debt, studies seem more converged, as most of them use a ratio of debt to assets and some distinguish short-term from long-term debt.

Table 2 - Summary of main empirical contributions for testing the impact of debt on firm performance

| Author (year) | Country | Period | Sample | Underlying theory | Methodology | Measure of debt | Measure of performance (dependent variable) | Impact of debt on performance |
|--------------------------------|---------|-----------------|--|--|--|--|--|-------------------------------|
| Mok <i>et al.</i> (2007) | China | 2002 | 238 foreign invested toy manufacturing firms | Agency theory | Tobit and OLS | Total liabilities to total assets ratio (TLTA) | Technical efficiency (DEA model) | (+) |
| Margaritis and Psillaki (2010) | France | 2002-2005 | 6,146 firms from low/high growth industries | Agency theory | Non-parametric data envelopment analysis (DEA) methods | TDTA | Firm efficiency (DEA model – value-added, capital and labor) | (+) |
| Tsuruta (2015) | Japan | 1996-2006 | 93,036 small businesses (364,925 obs.) | Agency theory | Regression model of Heckman | Book value of debt to assets ratio | Accounting profit, ROA, Sales growth rate | (+) |
| Singh and Faircloth (2005) | USA | 1996-1999 | 98 manufacturing firms | Theory of capital structure Myers's (1977) | Multivariate regression model | TDTA | R&D expenditure | (-) |
| Ghosh (2008) | India | 1995-2004 | 1,390 manufacturing firms | Trade-off theory | Econometric model; regression analysis | TDTA | ROA and ratio of cash flow to assets | (-) |
| Giroud <i>et al.</i> (2011) | Austria | 1998-2005 | 115 highly leveraged ski hotels | Theory of capital structure Myers's (1977) | OLS; cross-sectional regression | Book value of debt to assets ratio | ROA; NPM (Net Profit Margin) | (-) |
| Adjei (2012) | USA | 2000-2007; 2008 | 2,531 non-financial firms | NA | Fixed effects regression analysis | TDTA | Tobin's Q; ROA | (-) |
| Bernini <i>et al.</i> (2015) | France | 1997-2007 | 52,528 firms | Pecking order theory | Multivariate regression model | Debt to debt+equity+trade ratio | Quality output | (-) |

Table 2 - (cont.)

| Author (year) | Country | Period | Sample | Underlying theory | Methodology | Measure of debt | Measure of performance (dependent variable) | Impact of debt on performance |
|--------------------------------|--------------------------------------|-----------|---|----------------------|---|-----------------------|--|-------------------------------|
| Zeitun and Saleh (2015) | Gulf Coop. Council (GCC) | 2004-2012 | 400 firms from 18 industrial sectors | Pecking order theory | GMM | TDTA, Change in debt | Tobin's Q; ROA | (-) |
| Berk (2006) | Slovenia | 1997-2003 | 44 Slovenian blue-chip firms | Pecking order theory | OLS, bootstrapping and Fama-MacBeth regressions | Debt to capital ratio | ROE | Inconclusive |
| Dessi and Robertson (2003) | United Kingdom | 1967-1989 | 557 UK firms, 5,227 obs. | Agency theory | Static and dynamic Panel Regressions | TDTA | Tobin's Q; Return on Assets (ROA) | (+)/(0) |
| Abor (2005) | Ghana | 1998-2002 | 22 Ghanaian firms | NA | Panel data and regression analysis | LDA; SDA | Return on Equity (ROE) | (+)(-) |
| Weill (2008) | European countries | 1998-2000 | 11,836 SME from 7 European countries | NA | Panel data and regression analysis | TLTA | Efficiency scores (stochastic frontier approach) | (+)(-) |
| Jang and Tang (2009) | USA | 1990-2004 | 15 international hotels and 36 domestic hotels | Trade-off theory | (3SLS) procedure | TDTA, LDA & SDA | ROA | (+)(-) |
| Coricelli <i>et al.</i> (2012) | Central and Eastern Europe countries | 1999-2008 | 3,231 manufacturing firms/16 countries (27,506 obs.) | Trade-off theory | Threshold regression framework of Hansen (2000) | TDTA; TLTA | TFP (Total Factor Productivity) | (+)(-) |
| González (2013) | 39 countries | 1995-2004 | 10,375 non-financial firms from 39 countries; 40,886 firm-year observations | Agency theory | GMM | TDTA | Variation in operating performance (VOP)-change in ROA | (+)(-) |

Table 2 - (cont.)

| Author (year) | Country | Period | Sample | Underlying theory | Methodology | Measure of debt | Measure of performance (dependent variable) | Impact of debt on performance |
|----------------------------------|----------|-----------|--|---------------------------------|--------------------------------|---|--|-------------------------------|
| Ibrahim <i>et al.</i> (2013) | Malaysia | 2001-2009 | 436 non-financial firms | Agency theory | OLS | CSCH (diff in the year-end debt ratio before and after debt – issuance) | Buy and hold abnormal return (BHAR) | (+)/(-) |
| Wahba (2013) | Egypt | 2008-2010 | 14 Egyptian SME's | Agency Cost Theory | RE Model (panel data analysis) | TDTA, LDA& SDA | Firm Performance (FIN):ROA, ROE, Gross Profit Margin (GPM) | (+)/(-)(0) |
| El-Chaarani, (2015) | Europe | 2012 | 5,050 listed firms in eight European countries | Agency theory | Linear Regression analysis | Firm's total debt | Tobin's Q | (+)/(-) |
| Shahzad <i>et al.</i> (2015) | Pakistan | 1999-2012 | 112 companies from the textile sector | NA | Panel data ; OLS | TDTA, LDA, SDA and Debt to Equity (DE) | Tobin's Q; ROA | (+)/(-) |
| Vithessonthi and Tongurai (2015) | Thailand | 2007-2009 | 159,375 non-financial companies and 452,830 firm-year observations | Resource-based view of the firm | OLS; GMM | TLTA | ROA | (+)/(-) |

Notes: (+) and (-) represent respectively a positive and a negative relation; (+)(-) represent both results on the same study, under different conditions/variables; (0) represents results without statistical significance. GMM- generalized method of moments; RE - Random Effects; 3SLS - Three-stage least squares; TLTA - Total liabilities to total assets ; TDTA - Total debt to total assets ratio; LDA- Long term debt to assets ratio; SDA - Short term debt to assets ratio

Source: Own elaboration

2.2.1. Positive Impact

As seen on Table 2, when empirically analyzing the effect of debt on a firm's performance, a few authors (3 out of 21) find a positive impact.

Mok *et al.* (2007) analyzed Chinese toy manufacturing firms using Technical Efficiency as measure of performance estimated through a Data Envelopment analysis (DEA) model. Then the authors regressed the effect of debt on efficiency and of efficiency on profitability (using both the OLS and Tobit model). By finding that debt has a positive impact on efficiency and that efficiency has a positive impact on profitability, the authors conclude that debt has an overall positive effect on performance.

Margaritis and Psillaki (2010) studied French manufacturing firms from low and high growth industries, and used a two equation cross-section model to find how performance affects debt and how debt affects performance. The authors found support for one of arguments of the agency theory of Jensen and Meckling (1976), as higher debt is associated with better performance, or in other words, "improved efficiency" (Margaritis and Psillaki, 2010, p. 631). The effect was positive for both industries analyzed, although it seemed stronger for the traditional ones (chemicals and textile), fact that according to the authors corroborates some theoretical predictions about debt being more important for the performance of companies with less growth opportunities (Margaritis and Psillaki, 2010).

Recently, Tsuruta (2015) studied Japanese small businesses and also provided empirical support to the agency cost theory on its positive effect spectrum. Through a regression model, and using accounting profit as proxy for firm performance, the author found that highly-leveraged small businesses have better performance. Tsuruta (2015)'s main idea is that small businesses with higher debt will be under tight creditors' control and pressure to perform and show results. Owners will risk personal assets in case of default and so incentives are high for these businesses to perform well and succeed in meeting the debt payments (Tsuruta, 2015). Considering the information asymmetry between small businesses and their creditors, highly leveraged small businesses will have more investment opportunities, and on the other hand, while trying to escape

default, they will seek to reduce the burden of debt using other sources of financing (Tsuruta, 2015)

2.2.2. Negative Impact

If some studies attest a positive impact of debt on performance, 6 out of 21 record different results, and conclude the opposite effect.

Most studies that stand on a negative impact of debt on performance focus on the cost of debt and the idea of suboptimal investment, where firms with higher levels of debt should find it more costly to invest and could be viewed by suppliers and customers as having more risk of bankruptcy (Bernini, Guillou and Bellone, 2015).

To that extent, Singh and Faircloth (2005) study the impact of debt on Research & Development (R&D) expenditure in American manufacturing companies, and they conclude that higher leverage is associated with lower R&D expenditure, which is in turn an indicator of corporate performance, as it is associated with long-term competitive advantages, and financial and market growth (Singh and Faircloth, 2005). Measuring performance through R&D expenditure is not very common. Nor it is common to use “quality output” as measure, which is what Bernini *et al.* (2015) did. Analyzing French manufacturing exporters, and certain that “quality output” is a main competitive advantage in the international market, the authors found that higher debt belongs to the lowest performing companies and that debt financing has a negative impact on export quality, and hence, on firm performance (Bernini et al, 2015)

While using a different perspective, Ghosh (2008) came to a similar result: when analyzing the manufacturing textile sector in India, the author found a negative impact of debt on performance, namely for companies that finance themselves in international debt markets, as they become more vulnerable to currency depreciations and market volatility. According to the author, industries from the emerging markets face a trade-off between local and foreign financing, which causes mismatches in maturity and currency on companies’ balance sheets. When financing abroad, companies have more financing choices but risk currency devaluation. On the other hand, companies that do not resort to foreign debt markets have an interest risk that can come along with currency depreciation. Gosh therefore asserts that companies that access the foreign

market tend to be more exposed and to suffer more on their performance results once devaluation takes place (Gosh, 2008).

Among the studies that stand for a negative impact of debt on performance, a considerable number place their analysis within a crisis context (*e.g.*, Giroud *et al.*, 2011; Adjei, 2012 and Zeitun and Saleh, 2015). In particular, Giroud *et al.* (2011), who study defaulting Austrian sky hotels in the post 2008 crisis, argue that too much debt can distort incentives and lead to default. The authors stress the importance of distinguishing “strategic defaulters” – companies that have excessive debt – from “liquidity defaulters” – referring to companies that are in danger due to demand shocks - and conclude that by reducing debt overhang, companies improve performance. In spite of analyzing companies in crisis, Giroud *et al.* (2011) presume that one possible explanation for the negative role of debt is that the owners of leveraged firms may sacrifice important investments, deviate cash or sell firm’s assets and keep the resulting gains.

Adjei (2012) focuses on non-financial firms’ performance during the sub-prime mortgage crisis. Eliminating utility firms and financial institutions from his sample, and using Tobin’s Q and ROA as his main measures of performance, the author finds that for highly leveraged companies the higher the debt borrowed during the crisis the worse is corporate performance. The explanation lies on the fact that high debt companies will have higher costs of capital when requiring new external financing during the crisis, which in turn will lead to a decreased performance. That is also why the negative effect is no longer significant when analyzing low debt companies (because they more easily borrow to soften the financial crisis shock).

Zeitun and Saleh (2015) also use Tobin’s Q and ROA as measures of performance and with evidence from the Gulf Cooperation Council countries (GCC) conclude that debt affects firm performance negatively, and suggest that better-performing companies in the GCC countries are probably using more internal funds than debt (in line with the pecking order theory). The negative effect was found both before and after the 2008-2012 crises, with firms being more exposed to refinancing risks and higher financing costs.

2.2.3. Mixed/ inconclusive results

Looking at Table 2 one can easily recognize that more than half of the empirical studies analyzed (11 out of 21) actually present mixed results that is, under certain conditions the effect is positive, and under some other conditions, the effect is negative. Some studies present inconclusive results, meaning the relationship between debt and performance is not statistically significant.

In fact, the only inconclusive study identified was from Berk (2006), who studies blue chip companies in Slovenia. The author divided his sample into two groups, that is the companies that increased their debt and the ones that did not, and using both a bootstrapping technique and a Fama-Macbeth Regression the author's results weren't statistically significant. Berk (2006) believes the inconclusiveness of the studies, whose results do not corroborate the main theories of capital structure, may be related to structural changes (such as the post-socialism transitioning period) which in turn may be responsible for stronger signals and effects than capital structure decisions.

Dessi and Robertson (2003) first argue that most empirical studies claiming for a positive impact of debt on performance base their analysis assuming certain firm characteristics (such as high cash flow and low growth opportunities), that are difficult to grasp and measure. By affirming that in the existing literature "*capital structure is an endogenous influence on performance and is itself chosen on the basis of other, exogenous characteristics, which also affect performance directly*" (Dessi and Robertson, 2003, p.906), the authors explain that most studies do not consider the "endogeneity of debt", that is, all the unobserved factors that influence both debt structure and expected performance, such as market power and managers' skills and reputation (Dessi and Robertson, 2003).

Through a panel data analysis, and using companies' unobserved characteristics as fixed term effects, Dessi and Robertson (2003) find that, when not taking endogeneity into consideration, debt has a positive impact on performance. However, once endogeneity is considered, the relationship between the two variables ceases to be statistically significant.

Sustaining the trade-off theory and reinforcing the idea of an optimal level of debt, Coricelli, Driffield, Pal and Roland (2012) found that debt has a positive effect up to a threshold level, beyond which further increase in debt will cause a decrease in a

firm's performance. Moving past the optimal level, there will be excessive debt and Total Factor Productivity (TFP) growth will no longer benefit from it. As a result, companies with debt overhang will deviate from productive investments, not only because there will be less incentives to act accordingly, but also because they will be focused on generating cash flow to pay it off (Coricelli *et al.*, 2012).

Analyzing debt issuing Malaysian firms, Ibrahim *et al.* (2013) concluded that the positive impact of debt-issuing on performance is only observed for a three-year period (and not for a one and two-year period), which, according to the authors, may indicate that investors underreact to debt offerings, fact only corrected after three years. At the same time, authors state that among debt-issuers, firms with increased cash flow and debt will experience lower performance, which leads them to infer that the agency theory's positive role of debt as managerial controlling mechanism may not apply to this study, especially in the presence of other controlling instruments for solving agency conflicts.

Abor (2005) analyzes the impact of capital structure on the performance of Ghanaian firms and by using two different measures of debt – short and long term debt – comes to two different results: on the one hand, results show a negative relationship between long-term debt and performance, measured by the Return on Equity (ROE), and on the other hand, there is a positive relationship between short-term debt and performance. Overall, there is a significant positive relationship between total debt and performance, which may be due to the influence of the short term debt. In fact, Abor (2005) suggests that short-term debt is less costly which may imply more earnings under lower interest rates and similarly, the negative relationship found between long-term debt and ROE may be explained by the higher cost of the latter, which would therefore lower profitability. Being that in Ghana 85 % of companies rely on short-term debt, the author believes this has to do with the restrictions to long-term debt imposed by financial institutions (Abor, 2005).

Wahba (2013), like Abor (2005), shows that by dividing short and long term debt, results for the impact of debt on performance differ. But in the case of Wahba (2013) who studies Egyptian SME's and uses the Return on assets (ROA), return on equity (ROE), and gross profit margin (GPM) as measures of performance, results are opposite to Abors' (2005). Although results for total debt ratio weren't statistically significant,

Wahba (2013) finds that long-term debt contributes to enhancing firm performance while short-term debt has a negative impact on firm performance. Perhaps the difference lies in that fact that Wahba (2013) focuses on SME's while Abor (2005) studies larger firms. While Abor (2005) stresses the lower costs of short term debt, Wahba (2013) argues that short-term debt may limit SME's when searching for profitable projects and technology improvement, as well as make them more vulnerable to market fluctuations. Long-term debt may on the contrary reduce liabilities and promote sustainable investment and productivity (Wahba, 2013). Either way, the author asserts that that both effects will tend to cancel out, implying that ultimately debt will be less important for performance than what is believed.

Shahzad *et al.* (2015) use Tobin's Q and ROA to study Pakistani textile firms finding that each measure of performance leads to a different result: when using ROA, results show a negative impact of debt on performance whereas when using Tobin's Q the effect is positive. With a special focus on the global crisis of 2007-2008, the authors argue that the cost of borrowing in Pakistan puts firms on a fragile position, having to pay a huge amount of interest rates on their short-term bank loans, but conclude that the debt-performance relationship is too complex to be sorted in one single study, as their analysis proves to give different outputs according to the measure of performance that is used.

Other influencing variables can be taken into consideration. Weill (2008) focuses on the institutional framework as an impact factor on the debt-performance relationship. In fact, he finds that results vary according to the sample analyzed: within a group of European middle sized companies, the ones that operate in countries within a more favorable institutional environment (namely in what concerns access to credit and financial regulations) show a positive effect of debt on performance. On the contrary, those operating in countries under tighter institutional restrictions show an either insignificant or negative relationship between debt and performance. This work's innovation lies in the fact that it is one of the few which studies several countries, instead of being limited to a sample of firms from one single country.

Similarly, El-Chaarani (2015) studies firms from the eight biggest European economies (according to GDP) and compares their legal systems. The author finds that in economies under French civil law, which offers lower levels of legal protection, and

where debt decisions seem to be more concentrated on owners' hands, the impact of debt on performance is negative. However, in economies under common law, where legal protection is higher and ownership concentration lower, the impact of debt on performance is found to be positive. The author believes that this has to do with the risk of expropriation through debt - which is to be higher in French civil law economies and lower in common law countries.

On a different perspective, and to some level contradicting El- Chaarani (2015), González (2013) also studies companies under different legal and institutional systems, but finds that for some countries, such as France, even in times of financial distress, debt can still act as a managerial control mechanism and hence promote better performance. One of the differences that may be identified between both studies is that González (2013) places his study between 1995 and 2004, while El-Chaarani (2015) limits the analysis to the year of 2012. González concludes nonetheless that overall, in a crisis context, debt has a negative impact on performance (because higher levels of debt will lead to higher costs of financial distress and to a bigger decrease in operating profits).

When it comes to considering international business as a moderating variable, the work of Jang and Tang (2009) and of Vithessonthi and Tongurai (2015) assumes particular relevance, although they do not reach the same conclusions.

Jang and Tang (2009) studied international hotels in order to find out if international diversification and leverage were related in their effect on profitability. Based on the trade-off theory, and using the ROA as measure of performance, they concluded that although international diversification can boost the positive effect of debt on performance, the financial strategy and the search for the optimum level of debt have more impact on performance than business strategy decisions such as international diversification. In line with the trade-off theory, Jang and Tang (2009) summarize their findings by stating that the relationship between leverage, international diversification and profitability can also be represented by an inverted U-shape curve, indicating that there is a ceiling for improving performance through debt and international diversification, from which further action would increase costs and worsen performance.

Vithessonthi and Tongurai (2015) develop the hypothesis of whether the exporting-importing nature of the firm can act as a moderator of the impact of debt on performance. In order to test it, the authors use a sample of 159,375 non-financial firms from Thailand and use the ROA as their main measure of performance.

Unlike previously mentioned studies, Vithessonthi and Tongurai (2015) support their research on business internationalization literature and on the resource-based view of the firm, instead of corporate finance literature. At the end of the empirical analysis, the unmistakable contribution of this study is that the internationalization constitutes a trend-changing factor: while for the total sample the effect of debt on performance is negative, when the sample is divided into domestic vs. international firms, the effect of debt is, for the international-oriented firms, positive, and for domestic companies, negative.

When questioning why these studies differ in results and conclusions, one can easily observe that samples, countries and periods analyzed are different, and that authors focus on different moderating variables and on different measures of debt and performance, which may explain such inconsistency. Table 3 summarizes the different factors that may explain the mixed results of some studies when testing the impact of debt on a firm performance.

Table 3 - Potential explanatory factors for mixed results

| Explanatory factor | Author (s) |
|---|--|
| The use of different debt measure (debt maturity) | Abor (2005); Wahba (2013) |
| The use of different measure of performance | Shahzad et al. (2015); Coricelli et al. (2012) |
| Institutional/legal framework as a moderating factor | Weill (2008); El-Chaarani (2015); González (2013) |
| International Business/Orientation as a moderating factor | Jang and Tang (2009); Vithessonthi and Tongurai (2015) |

Source: Own elaboration

In conclusion, it is evident that both theoretical and empirical studies show little uniformity in either assumptions or results: In a sample of 21 empirical studies, 4 found a positive impact of debt on performance, 6 found a negative impact, 1 was inconclusive and 10 obtained mixed results.

Believing that these differences may be partially due to the lacking of moderating variables that can further specify and narrow down hypothesis (Jermias, 2008), some authors attempt to further explore specific criteria that may at last provide some consistent results on the relationship between debt and a firm performance. In that sense, and following the work of Vithessonthi and Tongurai (2015) we hope for a pertinent and enlightening analysis under the moderating variable of Internationalization, further dissected in different levels of international involvement.

3. Methodological Considerations

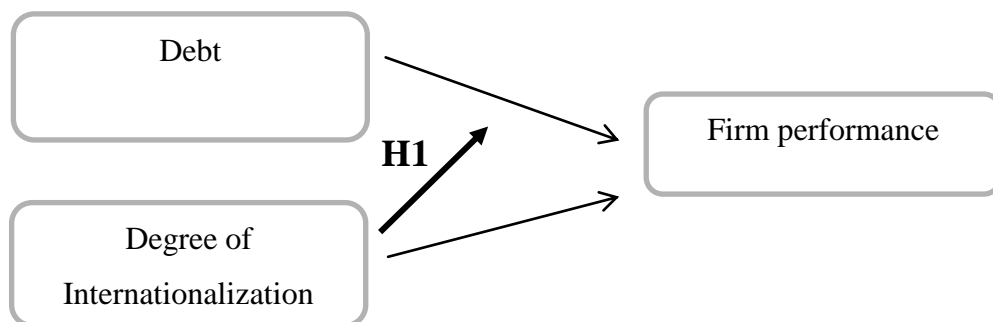
In this chapter we will first present our study's hypothesis (section 3.1) and outline the model specification (section 3.2.). Then we proceed with data source and sample definition (section 3.3.), following a brief descriptive analysis of the variables of the model (section 3.4.).

3.1. Research question and hypothesis

We propose to study the moderating role of internationalization on the debt-performance relation. Hence our goal is to answer the question: “Does the type of international involvement of a firm influence the impact of debt on performance?” In line with the arguments presented by Vithessonthi and Tongurai (2015) and addressed in section 2.1.4., we expect for the impact of debt on performance to be different when comparing different levels of firm's internationalization. To that extent, our study's hypothesis, as illustrated in Figure 3, is:

H1 – The international involvement of a company affects positively the impact of debt on a firm's performance. In particular, the higher the degree of internationalization, the stronger that effect.

Figure 3 - Path analysis diagram and study's hypothesis



3.2. Model Specification

In order to assess if internationalization can influence the impact of debt on performance, we will base our empirical study on a multivariate analysis. The econometric model is given by the following equation:

$$\begin{aligned} PERF_{it} = & \beta_0 + \beta_1 DEBT_{i,t-1} + \beta_2 INTER_{i,t-1} + \beta_3 DEBT_{i,t-1} * INTER_{i,t} + \beta_5 AGE_{i,t-1} \\ & + \beta_6 SIZE_{i,t-1} + \beta_7 GROWTH_{i,t-1} + Sector_{dummies} + Year_{dummies} + E_{i,t} \end{aligned} \quad (3.1)$$

Our dependent variable is *PERF* and designates performance.¹ As the main independent variables, *DEBT* is the debt ratio and *INTER* accounts for the level of international involvement. *DEBT*INTER* is an interactive term that aims at testing the moderating effect of internationalization via its interaction with debt on performance. We also introduce three control variables, similarly to most empirical studies (e.g. Margaritis & Psillaki (2010), Tsuruta (2015), Coricelli *et al.* (2012)): *AGE* (firm age), *SIZE* (firm size) and *GROWTH* (firm growth). Similarly to Vithessonthi and Tongurai (2015), we introduce two-digit sector dummies to control for the effects of industry specificities, as well as year dummies to account for unobserved year events. Finally, *E* represents residuals. Similarly to Margaritis and Psillaki (2010) we introduce a lag in the explanatory variables in order to minimize problems of endogeneity.

As measure of performance we will use the Return on Assets (ROA), following the work of Ghosh (2008), Giroud *et al.* (2011), Adjei (2012), Tsuruta (2015), Vithessonthi and Tongurai (2015) and Zeitun and Saleh (2015). As for *DEBT*, and similarly to Abor (2005), Jang and Tang (2009), Wahba (2013) and Shahzad *et al.* (2015), we will use short-term debt to assets, long-term debt to assets and total debt to assets ratios. In line with the theoretical literature discussed in the section 2.1.3., the expected effect of debt on performance can be either positive or negative.

Concerning internationalization (*INTER*), we use three alternative proxies. First, following Singla and George (2013)' approach, we measure the level of

¹ The subscripts *i* and *t* represent firm and year, respectively.

² SABI is a database edited by the Bureau van Dijk that contains comprehensive information on Spanish and Portuguese companies.

³ We have decided to limit our sample to the ones created before 2009 so that we could ensure that

internationalization through firm's export intensity (*EXP_INT*), obtained through the ratio of foreign sales to total sales. Second, extending Vithessonthi and Tongurai (2015)' categorization, we will control for four types of international activities: the companies that are not involved in international activities - domestic-, the importing companies, the exporting companies and the companies that are both importers and exporters. For these four levels, we relied on the categorization provided by SABI.²

However, since we identified some inconsistencies between the categorization of SABI and company data (in the sense that companies classified as domestic, for example, presented foreign sales or purchases), for a more cohesive dataset we decided to correct the status of companies that had contradictory data for the 5 analyzed years. Insofar as the type of international activities is a qualitative variable which characterizes the degree of firm's international involvement, it was introduced in the model through four dummies: *INTER1* (takes the value one if domestic company and 0 otherwise), *INTER2* (takes the value one if importing company and 0 otherwise), *INTER3* (takes the value one if exporting company and 0 otherwise), and *INTER4* (takes the value one if importing and exporting company and 0 otherwise).

Finally, in order to more easily compare our results to those of Vithessonthi and Tongurai's (2015), we will use a third proxy of internationalization (*INTER5*) that through a dummy variable will divide our sample in only two groups: *INTER5* takes the value of one when in presence of non-domestic companies, and the value of 0 otherwise. In light of the reviewed literature, a positive impact of internationalization on firm performance is anticipated.

As discussed in chapter 2, we expect internationalization to positively moderate the effect of debt on performance. To test this hypothesis we introduce the interactive term $DEBT_{t-1} * INTER$, with *INTER* measured through the four dummies *INTER1*, *INTER2*, *INTER3*, and *INTER4* or, alternatively, by dummy *INTER5* which separates domestic and international companies. Based on Vithessonthi and Tongurai (2015)' arguments set out in section 2.1.4, we expect the respective coefficient of the interactive term to be positive.

² SABI is a database edited by the Bureau van Dijk that contains comprehensive information on Spanish and Portuguese companies.

Finally, *AGE*, *SIZE* and *GROWTH* are control variables, for a vast majority of the empirical studies previously mentioned have considered them, fact that is also confirmed by Murphy *et al.*'s study (1996). Similarly to Coricelli *et al.* (2012) and Vithessonthi and Tongurai (2015), *SIZE* is measured by the logarithm of assets. Some authors predict both a positive and negative effect of size on performance: on the one hand, larger firms are expected to invest more in technology and have higher efficiency in monitoring top management and benefit from economies of scale (Margaritis and Psillaki, 2010); on the other hand, larger firms will tend to expand at the expense of profitability, as they become more exposed to rivalry, management constraints and regulatory costs (Goddard, Tavakoli and Wilson, 2005).

GROWTH is measured by growth in sales, like Dessi & Robertson (2003) and is expected to have a positive effect on performance. Finally, *AGE* is measured by the number of years since the establishment of the company (in logarithm), following authors such as Tsuruta (2015). According to Loderer and Waelchli (2010), age is viewed as having a negative impact on performance, as older companies will tend to become obsolete, slower and more rigid.

To sum up, the choice of explanatory variables is based on the insights of the literature review. Table 4 summarizes the variables and also presents the respective proxy and expected effect on performance.

Table 4 - Summary of model's explanatory variables

| Variable | Proxy | Expected result |
|------------------------------|--|-----------------|
| Total debt/total assets (TA) | | |
| DEBT | Short-term debt/TA | (+) / (-) |
| | Long-term debt/TA | |
| INTERNATIONAL involvement | 4 Dummy variables characterizing 4 levels of international involvement: Inter1 (Domestic); Inter2 (Importing), Inter3 (Exporting), Inter4 (Importing and Exporting). | (+) |
| | Inter5 : Dummy variable distinguishing domestic from non-domestic firms: value 0 (domestic); value 1 (international) | (+) |
| | Ratio of foreign sales to total sales | (+) |
| SIZE | Log of total assets; | (+) / (-) |
| AGE | Log(Nº of years since establishment of the firm) | (-) |
| GROWTH | Sales growth rate | (+) |

Source: Own elaboration

3.3. Data source and sample definition

Our sample is constituted of 2,244 Portuguese manufacturing companies extracted from the SABI database in June 2016, for the period of 2010 to 2014, and representing a total of 11,220 firm/year observations. We only considered companies whose date of creation was before 2009³, and with complete records for total assets, debt and turnover in all years analyzed.

Bearing in mind that we want to study the evolution in recent years of the debt-performance relationship in Portuguese companies, we tried to extend our analysis to before the 2008 crisis, but we noticed that during those years there was a lot of missing data and the national accounting system had changed, which ended up creating irregularities. We have therefore placed our analysis between the year of 2010 and 2014, where data is more consistent.

³ We have decided to limit our sample to the ones created before 2009 so that we could ensure that our companies were at least one-year old at the beginning of the period of analysis (while at the same time maximizing data availability).

We excluded from our database the non-active companies, as well as the micro-companies (those that have less than 10 employees and less than 2 Million Euros turnover). Banks and financial institutions were also excluded.

Our initial database had 2,405 companies. We limited the sample to the manufacturing sectors, and we excluded sectors 12 (tobacco industry) and 19 (oil industry) for lack of representativeness. We also eliminated companies with negative debt and finally those whose internationalization status (attributed by SABI) was contradictory with their sales and purchases data. These exclusion criteria led to our final sample of 2,244 companies.

3.4. Brief descriptive analysis

In order to understand our variables' behavior, Table 5 presents a global analysis on the descriptive statistics. A brief analysis follows. Table A1 in appendix provides the averages by sector (according to the Portuguese classification of economic activities – CAE - of Statistics Portugal -INE).

Table 5 - Overall descriptive statistics of the model's variables

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|----------------------|--------|--------|-----------|---------|-----------|
| ROA (%) | 11,220 | 3.93 | 9.24 | -189.95 | 74.62 |
| Age (Years) | 11,220 | 28.83 | 17.40 | 2 | 129 |
| Size (TA, th. euros) | 11,220 | 20,001 | 23,263 | 462 | 1,048,295 |
| Growth (%) | 11,220 | 6.33 | 22.52 | -75.42 | 378.35 |
| Total Debt (%) | 11,220 | 58.70 | 22.31 | 1.33 | 290.13 |
| Short-term debt (%) | 11,220 | 42.52 | 19.59 | 1.33 | 175.58 |
| Long-term debt (%) | 11,220 | 16.18 | 15.93 | 0 | 249.64 |
| Exp_Int (%) | 10,919 | 44.29 | 36.68 | 0 | 100.00 |

Source: Own elaboration based on SABI | **Notes:** ROA - Return on Assets; EXP_INT – Export intensity

When looking at Table 5, one can notice almost immediately that the average performance of our sampled companies isn't very high: only 3.93 % for the return on assets (ROA). This variable presents big amplitude, with a minimum value of – 189.95% and a maximum value of 74, 62 %. Considering the information from Table A.1 (in Appendix), the worse performing economic activity sector is CAE 23 - Manufacture of other non-metallic mineral products- with 0.97 % average ROA. On the other hand, the best-performing sector is CAE 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations - with an average 7.2% ROA.

Companies are on average 29 years old, which indicates older companies and may often be associated to bigger rigidity and lower performance (Loderer and Waelchli, 2010). As indicated by Table A.1 (in appendix), sector CAE 11 - Manufacture of beverages - is the one that, on average, presents the oldest companies (with an average of 36 years of age), and CAE 26 - Manufacture of computer, communication equipment, electronic and optical products- presents the youngest companies of the industry (with an average of 21 years).

Size, measured by the total assets of the company, shows a minimum value of 462 thousand Euros and a maximum value of more than 1 billion Euros. Our sample of companies presents average total assets of roughly 20 Million Euros, implying that companies tend to be medium-sized. CAE 11 rates first on Size (average 49 Million average total assets), and on the opposite spectrum, CAE 15 - Manufacture of leather and related products – presents the smaller companies (average 6 Million average total assets).

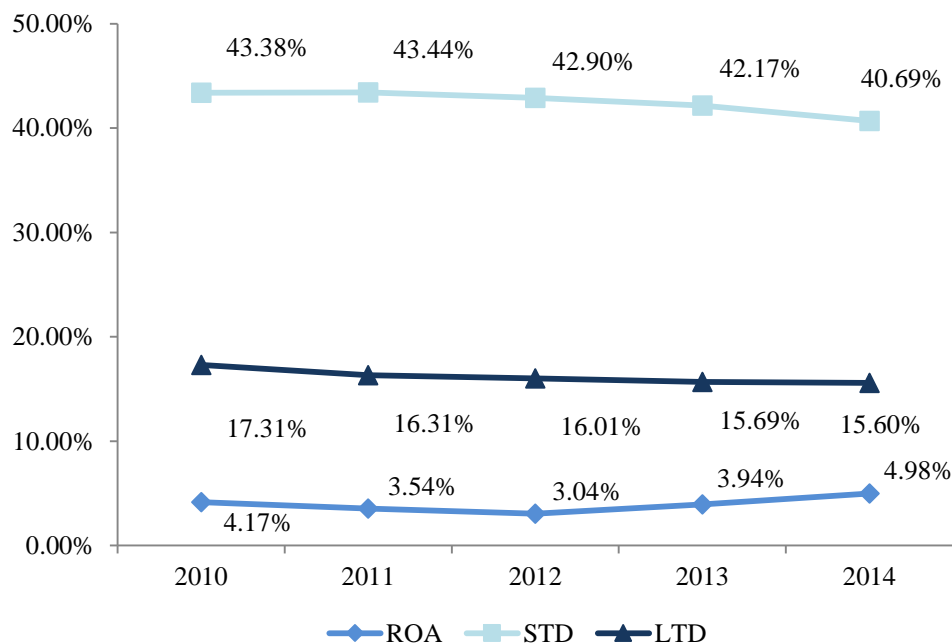
As for the variables Growth and Debt, one can see that results vary more. In the case of Growth, minimum and maximum values range from -75.42% to 378.35%. The lowest growth rate belongs to CAE 18 - Printing and reproduction of recorded media - which records an average growth of 0.61%, and the highest average growth (10.22%) belongs to CAE 15 - Manufacture of leather and related products. Debt also has a considerable variation and presents a 58.7% average result. The sector with highest average total debt level is the CAE 29 - Manufacture of motor vehicles, trailers, semi-trailers and parts and accessories for motor vehicles - with 64.4% and oppositely, the one with lowest average debt level is CAE 26, with a 51.98% average debt.

When further analyzing debt maturity, that is, short-term and long-term debt, one can notice that short-term debt is on average higher than long term debt (42.5% versus 16.2%). However, long-term debt presents the biggest amplitude, with a minimum value of 0% and a maximum value of 249.64%. CAE 33 - Repair, maintenance and installation of machinery and equipment – shows the highest short-term debt rate (average 52.45 %), while CAE 23 presents the lowest (average 33.97 %). The highest long-term debt average is found in CAE 11 (25.09%) and the lowest belongs to CAE 26 (with a 7.5% ratio).

Finally, our sample of companies has an average export intensity of 44.29 % but there is high amplitude, with values ranging from 0% to 100 %, which means that very diverse firms in what respects to export intensity are present in our sample. The sector with highest export intensity is CAE 15 (rating 72%) and the one with lowest export intensity is CAE 18 (with 14.18 %)

In order to complement the global analysis of variables it is important to understand their evolution over the period considered, particularly for our main variables: debt, performance, level of international involvement.

Graphic 1 - Evolution of ROA, short-term and long-term debt 2010-2014



Source: Own elaboration based on SABI | **Notes:** STD – Short-term debt; LTD – Long-term debt; ROA - Return on Assets.

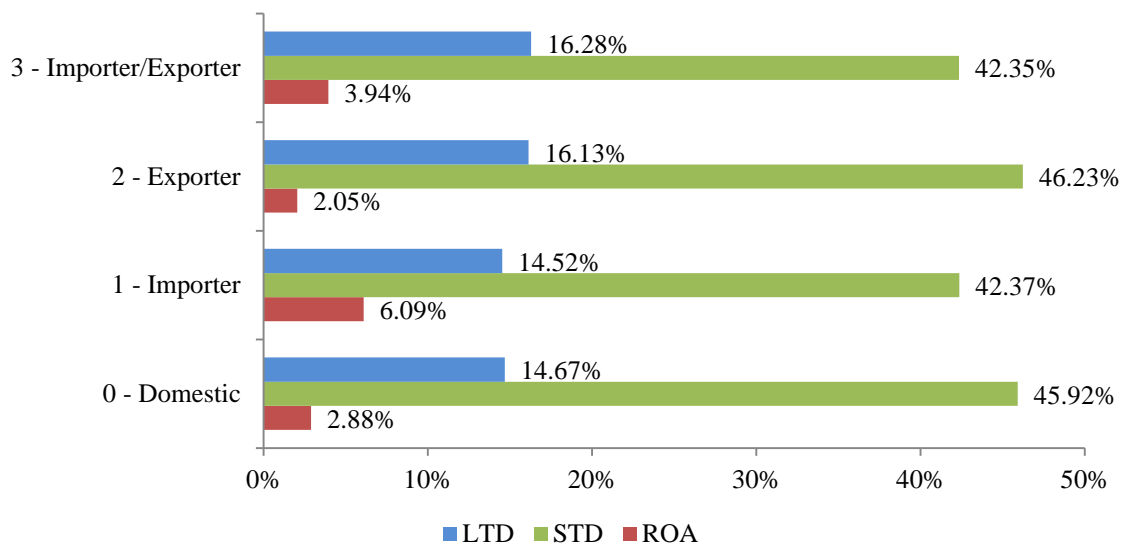
Analyzing Graphic 1, we can conclude that for our sample of companies, Debt reaches much higher levels than Performance, and that the two variables have assumed opposite trends from 2010 to 2014.

Although short-term debt is for every year higher than long-term debt, both types of debt have decreased since 2010, attaining their lowest value in 2014 (40.69% and 15.60% respectively). This is not surprising since that period coincides with the TROIKA's ⁴ intervention in Portugal and the credit restrictions that Portuguese companies had to face (Farinha and S. Félix, 2015). The average Return on Assets , while decreasing in 2012 to 3% - perhaps suffering from the negative effect of the 2008 crisis- has grown to 5 % in 2014, a result that surpasses the 2010 value (at the time the average ROA was 4%).

⁴ International Monetary Fund (IMF), the European Financial Stabilization Mechanism (EFSM), and the European Financial Stability Facility (EFSF).

Given that internationalization will expectedly assume a trend-changing role, it is pertinent to analyze the averages of the main variables (debt and performance) under the four levels of international involvement. Graphic 2 therefore shows how the different levels of international involvement behave when it comes to performance and debt (here divided in short-term and long-term debt).

Graphic 2 - ROA and Types of Debt per level of International Involvement



Source: Own elaboration based on Sabi| **Notes:** ROA- Return on Assets; STD - short-term debt; LTD - long-term debt;

At a first glance, domestic companies seem to be in disadvantage: their mean ROA is the second lowest (2.88%), while their average level of total debt is among the highest (60.59%). Importing companies appear to perform better than exporting companies (higher average ROA), while presenting lower average debt levels (56.89 % versus 62.37% of exporting companies).

Exporting companies show unexpected figures: their performance is the lowest of the group and their average total debt is the highest.

Contrary to the findings of Vithessonthi and Tongurai (2015), in our sample, domestic firms present higher levels of short-term debt than importing-exporting companies (45.92% versus 42.35%, respectively) but lower levels of long-term debt (14.67%). Importing companies perform the best (6.09% ROA ratio versus 2.05% from

exporting companies and 2.88% and 3.94% from the domestic and import-export level, respectively).

Unlike what was expected, when it comes to both performance and debt, results don't seem easy to interpret nor to put in some ascending or descending order.

Further enlightenment may be provided in Table 6, which summarizes the descriptive statistics dividing our sample of companies into those who have some degree of international involvement (named international companies) and those whose activities are exclusively held within national borders (domestic companies).

Table 6 - Descriptive Statistics comparing international vs. domestic companies

| INTER | ROA (%) | AGE (Year) | SIZE (TA, th. euros) | Growth (%) | Total Debt (%) | Short- term debt (%) | Long- term debt (%) | Exp_int (%) |
|-------------------|--------------------|-----------------------|---------------------------------|-----------------------|-------------------------------|-------------------------------------|--|------------------------|
| Domestic (0) | 2.88 | 28.56 | 13,460.39 | 4.28 | 60.59 | 45.92 | 14.67 | 0.00 |
| International (1) | 3.97 | 28.83 | 20,236.61 | 6.40 | 58.63 | 42.39 | 16.23 | 45.55 |
| Total | 3.93 | 28.82 | 20,001.08 | 6.33 | 58.69 | 42.51 | 16.18 | 44.29 |

Source: Own elaboration based on SABI| **Notes:** 0 – Domestic companies; 1- International companies; ROA - Return on Assets; EXP_INT – Exporting intensity

Table 6 shows that international companies present a better performance than domestic companies (3.97% ROA versus 2.88% from domestic companies). International companies, albeit older (28.83 vs. 28.56), are bigger in assets (average Total Assets of 20 Million € vs. 13 Million € from domestic companies) growth (6.40 vs. 4.28), and of course in export intensity (45.55% vs. none from domestic companies). More importantly, they also have lower levels of total debt and short-term debt compared to domestic companies (ratios varying from 58.63 vs. 60.59, 42.39 vs. 45.92) although long term debt is on average higher for these companies (they present an average of 16.23 vs. 14.67 from domestic companies).

4. Empirical Analysis

In the remainder of this section we will test our model, first by analyzing the variables correlations (Section 4.1) and then regressions' results (Section 4.2). We conclude with a discussion of the results (Section 4.3.).

4.1. Correlations

Before proceeding with the model estimation, it is convenient to analyze the extent to which independent variables are correlated. We hence test the bivariate correlations of the variables according to the Pearson's Correlation test. Table 7 presents these main variable's correlations.

Table 7 - Pearson's Correlation Coefficients

| | ROA | AGE | SIZE (TA) | GROWTH | Total debt | Short- term debt | Long term- debt | Exp_int |
|----------------------------|----------|----------|--------------|---------|---------------|------------------------|--------------------|---------|
| ROA | 1.0000 | | | | | | | |
| AGE | -0.0514* | 1.0000 | | | | | | |
| SIZE (TA) | 0.0263* | 0.1308* | 1.0000 | | | | | |
| GROWTH | 0.1565* | -0.0844* | 0.0010 | 1.0000 | | | | |
| Total debt | -0.3927* | -0.1773* | -0.0070 | 0.0764* | 1.0000 | | | |
| Short-term debt | -0.2076* | -0.1869* | -0.0873* | 0.0931* | 0.7183* | 1.0000 | | |
| Long term- debt | -0.2949* | -0.0185* | 0.0975* | -0.0075 | 0.5175* | -0.2236* | 1.0000 | |
| Exp_int | 0.0854* | -0.0233* | 0.0484* | 0.1035* | 0.0015 | 0.0387* | -0.0453* | 1.0000 |

Source: Sabi and Own elaboration| **Notes:** INTER- 4 levels of international involvement; ***, ** and * represent significance at 1%, 5% and 10%, respectively.

One can notice in table 7 that export intensity is positively correlated to performance, although only significant at the 10 % level.

On the contrary, all levels of debt are negatively correlated with Performance (ROA), with total debt assuming the strongest coefficient and short-term debt the weakest.

On the contrary, all levels of debt are negatively correlated with Performance (ROA), with total debt assuming the strongest coefficient and short-term debt the weakest.

Long-term, short-term and total debts naturally present higher levels of correlation but these variables will not be used simultaneously in the models as they are alternative proxies for measuring the debt, so it does not raise problems in the model estimation.

Additionally, Size and Growth are positively correlated with performance, and Age shows, as expected, the opposite correlation.

Furthermore, all types of debt are negatively and significantly correlated with age but the correlation coefficients are small. Size is positively and significantly correlated with long-term debt but negatively correlated with short-term debt. As for growth, the correlation with performance and debt (total debt and short-term debt) is positive and statistically significant. Overall, correlation coefficients between independent variables are weak, therefore sustaining our model, which will be explored in the next section.

4.2. Estimation results

As previously mentioned, we intend to test the effect of international involvement as a moderator of the debt-performance relation with the model presented by equation (3.1). For this purpose, we use three alternative proxies for measuring international involvement, as reported on Section 3.2.

Because our model includes variables that do not change for companies over time, we estimate our regressions using the random effects model (Baltagi, 2008).

Table 8 presents the estimations results considering *EXP-INT* as a measure of internationalization. Three kinds of models were estimated and for each three alternative proxies for debt were used: total debt (TD), short-term debt (STD) and long-term debt (LTD). Model I does not include the interactive term between debt and internationalization, model II contemplates the interaction term of *DEBT* and the *INTER*

variable, and in this case the internationalization level is measured by Inter5, a dummy that assumes the value of 1 for international companies and 0 otherwise. Finally, model III also includes the interactive term, this time based on the four international levels proxy: Inter2 represents importing companies, Inter3 exporting companies and Inter4 importing and exporting companies (because we are working with dummies for our internationalization levels, we omit domestic companies (Inter1) and compare our results against that group of firms).

Analyzing the results for model I, table 8 shows in columns (1), (2) and (3) that export intensity is positively and significantly correlated with performance. The coefficient is roughly the same for all debt maturities. As for the effect of debt on performance, for all proxies, the impact is negative and statistically significant, but in this first estimation, short-term debt has a lower coefficient than long-term debt, meaning that the latter will have a greater negative impact on performance.

Regarding model II, looking at columns (4), (5) and (6) one can notice that the variable export intensity maintains a positive effect on the performance and debt maintains a negative and statistically significant coefficient. Concerning the interactive term with Inter5, it is positive for all proxies of debt but lacks statistical significance, whether considering short-term, long-term or total debt.

Finally, in respect to model III, columns (7), (8) and (9) confirm the positive impact of the variable export intensity and the negative impact of debt. Additionally, results confirm the expected moderating effect of internationalization on the debt-performance relation. This is because the coefficient of the interactive term Debt*Inter2 is positive and statistically significant for the three debt proxies. This suggests that when in presence of leverage, importing companies will perform better than their domestic counterparts. Results for the interactive term with exporting (Inter3) and importing-exporting (Inter4) companies indicate that while importing-exporting firms will perform better than domestic firms when in presence of debt, for the exporting firms, performance will be worse. Even so, results aren't statistically significant.

Table 8 - Results of random effects panel data regression for the moderating effect of internationalization (measured by 3 different proxies)

| | MODEL I | | | MODEL II | | | MODEL III | | |
|--------------------|----------------|---------------------|--------------------|-------------------------|------------------------------|-----------------------------|------------------------|-----------------------------|----------------------------|
| Variable | Total Debt (1) | Short-term debt (2) | Long-term debt (3) | Total Debt (Inter5) (4) | Short-term debt (Inter5) (5) | Long-term debt (Inter5) (6) | Total Debt (Inter) (7) | Short-term debt (Inter) (8) | Long-term debt (Inter) (9) |
| Debt | -0.080*** | -0.034*** | -0.071*** | -0.084*** | -0.041*** | -0.076* | -0.083*** | -0.040*** | -0.075** |
| AGE | -0.943*** | -0.483* | -0.465 | -0.942*** | -0.483* | -0.465 | -0.903*** | -0.457 | -0.433 |
| SIZE | -0.519*** | -0.625*** | -0.409** | -0.521*** | -0.627*** | -0.410** | -0.543*** | -0.645*** | -0.423** |
| GROWTH | 0.033*** | 0.031*** | 0.029*** | 0.033*** | 0.031*** | 0.029*** | 0.033*** | 0.031*** | 0.029*** |
| EXP_INTERNT | 0.022*** | 0.023*** | 0.022*** | 0.022*** | 0.022*** | 0.022*** | 0.023*** | 0.023*** | 0.023*** |
| Debt*Inter5 | | | | 0.004 | 0.007 | 0.005 | | | |
| Debt*Inter2 | | | | | | | 0.036** | 0.042*** | 0.083* |
| Debt*Inter3 | | | | | | | -0.029 | -0.025 | -0.099 |
| Debt*Inter4 | | | | | | | 0.003 | 0.006 | 0.004 |
| R2 | 0.15 | 0.09 | 0.11 | 0.15 | 0.09 | 0.11 | 0.15 | 0.09 | 0.11 |
| Obs. | 8,724 | 8,724 | 8,724 | 8,724 | 8,724 | 8,724 | 8,724 | 8,724 | 8,724 |

Source: Own elaboration using SABI and Stata estimations| Size and age are in expressed in logarithms. All explanatory variables are lagged one year. | **Notes:** ***, ** and * represent significance at 1%, 5% and 10%, respectively.

Regarding the control variables and starting with *AGE*, the negative coefficient of this variable (statistically significant in 5 of the 8 models estimated) indicate, as expected, that age has a negative impact on performance. As for *SIZE*, coefficients are

negative and statistically significant for all estimations, suggesting that size, measured through total assets, has a negative effect on firm performance.

In order to see if results differ when using other proxies for measuring the international involvement, particularly when we measure this involvement through the dummy variables instead of export intensity, tables 9 and 10 provide the estimations results.

Table 9 - Results of random effects panel data regression for the moderating effect of internationalization (measured by *EXP_INT*, *Inter1*, *Inter2*, and *Inter3*)

| | MODEL I | | | | MODEL II | | | |
|--------------------|-------------------|------------------------|-----------------------|------------------------|---------------------------------|-------------------------------|--|--|
| Variable | Total Debt (1) | Short-term debt (2) | Long-term debt (3) | Total Debt (IT) (4) | Short-term debt (IT) (5) | Long-term debt (IT) (6) | | |
| Debt | -0.080*** | -0.032*** | -0.072*** | -0.055 | -0.015 | -0.050 | | |
| AGE | -0.903*** | -0.444 | -0.438 | -0.898*** | -0.437 | -0.441 | | |
| SIZE | -0.433** | -0.542*** | -0.316 | -0.435** | -0.542*** | -0.317 | | |
| GROWTH | 0.034*** | 0.032*** | 0.030*** | 0.034*** | 0.032*** | 0.030*** | | |
| Inter2 | 3.328*** | 3.717*** | 3.467*** | 4.507 | 5.105** | 3.730*** | | |
| Inter3 | -0.316 | -0.364 | -0.492 | 4.294 | -0.219 | 1.244 | | |
| Inter4 | 1.510* | 1.594** | 1.580* | 3.084 | 2.423 | 1.909* | | |
| Debt*Inter2 | | | | -0.019 | -0.031 | -0.018 | | |
| Debt*Inter3 | | | | -0.074 | -0.003 | -0.110 | | |
| Debt*Inter4 | | | | -0.026 | -0.018 | -0.022 | | |
| R2 | 0,15 | 0,09 | 0,11 | 0,15 | 0,09 | 0,11 | | |
| Obs. | 8762 | 8762 | 8762 | 8762 | 8762 | 8762 | | |

Source: Own elaboration using SABI and Stata estimations| Size and age are in expressed in logarithms. All explanatory variables are lagged one year. | **Notes:** ***, ** and * represent significance at 1%, 5% and 10%, respectively.

In table 9, internationalization is measured taking into account the four levels of international involvement (INTER2, INTER3 and INTER4) and two models are estimated: one without the interactive term and one including the interactive term (Model I and model II, respectively). Alternatively, in table 10, internationalization is measured taking into account the dummy INTER5 and two models are also estimated: without interactive term (Model I) and including the interactive term (model II).

The four levels of international involvement are then presented in Table 9. For each of the samples, regressions are estimated with one of the three proxies of debt (total, short-term and long-term).

In line with Vithessonthi and Tongurai's (2015) findings, and looking at columns 1-3, debt has for all proxies a negative and statistically significant impact on performance (the highest coefficient belonging to total debt).

From columns (1), (2) and (3), we can confirm some trends seen in table 8: importing companies (Inter2) perform better compared to domestic companies, and importing–exporting companies (Inter4) also present a positive coefficient on performance. The coefficient for the variable Inter3 (Exporting companies) is negative but not statistically significant.

Finally, we can see in columns (4), (5) and (6) that including an interactive term with lagged debt leads to a majority of positive coefficients of the Inter variable, but they are not statistically significant. Regarding debt, results show that for all estimations, all proxies have a negative impact on performance. However, results fail to be statistically significant. Overall, the negative results of debt show that for the majority of our firms, an increase in leverage leads to a decrease in performance.

Regarding the control variables the results are relatively similar to those of Table 8: Age has a negative impact on performance, but coefficients are only statistically significant when using total-debt proxy; Table 9 indicates a negative and statistically significant impact of size on performance when using total debt or short term debt; finally, Growth presents the expected positive and statistically significant impact on performance regardless of the debt proxy used.

Table 10 runs the same analysis as table 9 but instead of four levels of internationalization we use the proxy Inter5, where a dummy variable assumes the value of 0 for domestic companies and the value of 1 otherwise.

Table 10 - Results of random effects panel data regression for the moderating effect of internationalization (measured by *EXP_INT* and *Inter5*)

| MODEL I | | | | | MODEL II | | | |
|--------------------|--------------|-------------|------------------------|-----------------------|-------------------|----------------------|---------------------------------|-------------------------------|
| Variable | Total (1) | Debt (2) | Short-term debt (3) | Long-term debt (3) | Total (IT) (7) | Debt (IT) (8) | Short-term debt (IT) (9) | Long-term debt (IT) (9) |
| Debt | -0.080*** | | -0.032*** | -0.072*** | -0.055 | | -0.015 | -0.050 |
| AGE | -0.943*** | | -0.488* | -0.479* | -0.937*** | | -0.483* | -0.481* |
| SIZE | -0.419** | | -0.528*** | -0.301 | -0.421** | | -0.528*** | -0.302 |
| GROWTH | 0.034*** | | 0.032*** | 0.030*** | 0.034*** | | 0.032*** | 0.030*** |
| Inter5 | 1.544** | | 1.636** | 1.612** | 3.105 | | 2.442 | 1.956** |
| Debt*Inter5 | | | | | -0.026 | | -0.018 | -0.023 |
| R2 | 0,14 | | 0,08 | 0,1 | 0,14 | | 0,08 | 0,1 |
| Obs. | 8976 | | 8976 | 8976 | 8976 | | 8976 | 8976 |

Source: Own elaboration using SABI and Stata estimations| Size and age are in expressed in logarithms. All explanatory variables are lagged one year. | **Notes:** ***, ** and * represent significance at 1%, 5% and 10%, respectively.

Looking at table 10, we can see that debt remains with a negative coefficient, implying a negative impact on performance (model I), although the statistical significance is only kept when not including the interactive term (model II).

Columns (1), (2) and (3) reveal that the coefficients of *Inter5* on performance are positive and statistically significant, which indicates that international companies perform better compared to domestic companies.

When we interact debt with internationalization (here separating domestic from international companies), coefficients of *Inter 5* remain positive, but only keeping statistical significance for the long-term debt proxy.

As for the interactive term with Inter5, are negative implying that the negative impact of debt will be greater for international companies when compared to domestic firms. Yet these coefficients lack statistical significance.

For the other variables, table 10 confirms previous results from table 9. Starting with AGE, the coefficient is negative and statistically significant in all estimations. SIZE is also negative not statistically significant for long term debt. Moreover, GROWTH coefficients are positive and statistically significant for all estimations.

The suggested negative impact of Age on Performance and positive impact of Growth on Performance is in line with our previous expectations⁵. As for Size, and as discussed in section 3.2., some studies point to a positive effect of size on performance (Silva and Maçãs, 2008), while others focus on the negative effect (Goddard, Tavakoli and Wilson, 2005). In our case, Size is negatively correlated with performance, and results are for most cases of statistical significance.

In conclusion, the use of different proxies for internationalization provides different results: Export-intensity shows a positive and statistically significant effect on performance; results measuring internationalization with four levels indicate a positive moderating effect of internationalization for importing companies (Inter2), but results using Inter5 estimations aren't statistically significant.

Concerning our study's hypothesis (internationalization moderates the effect of debt on performance and in particular, the higher the international involvement, the stronger the coefficient), Table 9 and 10 do not provide empirical support because the coefficients on the interactive term *DEBT*INTER*, in spite of indicating a moderating effect of internationalization on the debt-performance relation, lack statistical significance. However, results presented in table 8 (when using export intensity and the interactive term of debt with Inter2, Inter3 and Inter4) indicate support for H1 and for the expected positive moderating effect of debt on performance.

At the beginning of our study, and being aware of the existing literature, we expected for internationalized firms to be less negatively impacted by debt when compared to domestic companies.

⁵ Although we wished to complete our analysis by estimating our model on different subsamples, such as Vithessonthi and Tongurai (2015) do, the size of our samples wasn't representative, as the number of companies in some categories was too small.

Having as guidance the work of Vithessonthi and Tongurai (2015), who found that leverage had a negative impact on performance for domestic companies but a positive effect for the international-oriented ones, we have confirmed support for our hypothesis.

5. Conclusion

Corporate financial decisions are unquestionably crucial for every company. Based on the vast and complex literature that scrutinizes the impact of financing decisions on performance, we started this work hoping to contribute to the debate with a innovative empirical model, one that assumed internationalization as the key moderating factor, impacting performance both by itself and interacting with debt. We have therefore analyzed the moderating effect of international activities in the debt-performance relation using a panel database of 2,244 Portuguese manufacturing companies.

In regard to the impact of debt on performance, long-term debt has stronger negative coefficients on performance, as opposed to short-term debt, the one that is most used by our sample of firms, which presents weaker negative coefficients, suggesting a smaller negative impact on performance. The explanation may lie on the fact that short-term debt is considered less costly and therefore may not lower profitability as much as long-term debt (Abor, 2005).

In light of the international business literature we expected for internationalization to positively influence performance, and we have found empirical support for that expected relationship. Concerning the moderating role of internationalization on the debt-performance relation, also we found some evidence that supports this hypothesis. In fact, when using export intensity and four levels of international involvement as proxy for internationalization, our results show that for internationalized companies, particularly those involved in importing activities, the effect of debt on performance is positive.

Although we do not find support for our study hypothesis when using other measures of internationalization, this is to the best of our knowledge the only study trying to explain the relation between debt and performance of Portuguese manufacturing companies' through the moderating role of internationalization (and with the innovative distinction of four levels of international involvement).

Our study presents some limitations: to simplify our model we did not introduce the lagged performance as explanatory variable, but some authors, such as Zeitun and

Saleh (2015), emphasize the importance of past performance as an encouragement to further investment and increased positive results, and so encourage the use of a lagged dimension of performance, one that includes in the current year the effect of the previous year. Also, we had some difficulties in clearly distinguishing our sample's international levels, often due to incoherence from SABI's classifications, which resulted in an undersized sample with a reduced number of companies for some categories of international involvement. Moreover, we haven't included the cost of debt, due to limited data access. Future research should extend the analysis not only including services, but also analyzing credit restrictions and institutional factors which may better explain corporate performance.

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Appendix A

Table A.1 - Descriptive statistics per Industry Sector (Portuguese classification of economic activities according to Statistics of Portugal)

| SECTOR DESCRIPTION | ROA | AGE | SIZE (TA) | GROWTH | TD | STD | LTD | EXP_INT |
|--|------|-------|-----------|--------|-------|-------|-------|---------|
| 10 - Manufacture of food products | 3.10 | 30.80 | 20713.05 | 5.37 | 59.06 | 42.59 | 16.47 | 18.69 |
| 11 - Manufacture of beverages | 1.94 | 36.43 | 49187.17 | 4.83 | 60.23 | 35.14 | 25.09 | 36.39 |
| 13 - Manufacture of textiles | 3.10 | 28.40 | 17568.90 | 9.61 | 58.77 | 41.39 | 17.38 | 50.08 |
| 14 - Manufacture of wearing apparel | 3.57 | 27.51 | 7326.85 | 7.56 | 62.30 | 49.38 | 12.92 | 70.75 |
| 15 - Manufacture of leather and related products | 6.62 | 25.56 | 5853.81 | 10.22 | 60.14 | 49.64 | 10.50 | 71.92 |
| 16 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 2.00 | 27.59 | 16324.64 | 7.44 | 63.12 | 40.22 | 22.89 | 49.23 |
| 17 - Manufacture of paper and paper products | 4.94 | 27.00 | 39305.72 | 9.80 | 58.55 | 42.46 | 16.09 | 24.06 |
| 18 - Printing and reproduction of recorded media | 2.78 | 31.76 | 10457.93 | 0.61 | 60.25 | 39.65 | 20.60 | 14.18 |
| 20 - Manufacture of chemicals, chemical products and man-made fibres, except pharmaceutical products | 5.36 | 32.00 | 28760.94 | 6.38 | 54.64 | 41.59 | 13.05 | 25.39 |

Table A.1 – (Cont.)

| SECTOR DESCRIPTION | ROA | AGE | SIZE (TA) | GROWTH | TD | STD | LTD | EXP_INT |
|--|------|-------|-----------|--------|-------|-------|-------|---------|
| 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations | 7.20 | 34.11 | 43743.41 | 5.59 | 58.39 | 38.57 | 19.82 | 25.95 |
| 22 - Manufacture of rubber and plastic products | 4.54 | 28.51 | 15685.14 | 7.21 | 58.81 | 41.19 | 17.62 | 41.48 |
| 23 - Manufacture of other non-metallic mineral products | 0.97 | 30.50 | 32031.12 | 0.96 | 56.33 | 33.97 | 22.36 | 39.44 |
| 24 - Manufacture of basic metals | 2.12 | 27.48 | 29093.73 | 8.31 | 54.21 | 42.76 | 11.45 | 45.71 |
| 25 - Manufacture of fabricated metal products, except machinery and equipment | 4.31 | 27.38 | 11572.85 | 5.91 | 58.56 | 42.14 | 16.42 | 47.60 |
| 26 - Manufacture of computer, communication equipment, electronic and optical products | 6.54 | 20.45 | 34422.35 | 5.88 | 51.98 | 44.44 | 7.55 | 55.84 |
| 27 - Manufacture of electrical equipment | 4.15 | 30.58 | 35719.81 | 3.55 | 52.83 | 39.13 | 13.69 | 47.15 |
| 28 - Manufacture of machinery and equipment n.e.c. | 5.77 | 28.39 | 16484.06 | 5.47 | 52.29 | 37.67 | 14.63 | 51.29 |
| 29 - Manufacture of motor vehicles, trailers, semi-trailers and parts and accessories for motor vehicles | 5.27 | 26.36 | 40977.11 | 8.70 | 64.40 | 49.48 | 14.92 | 64.47 |
| 30 - Manufacture of other transport equipment | 2.03 | 30.94 | 9152.94 | 7.02 | 61.31 | 46.06 | 15.25 | 62.49 |
| 31 - Manufacture of furniture | 1.40 | 29.53 | 10515.29 | 4.63 | 59.16 | 42.05 | 17.11 | 50.31 |
| 32 - Other manufacturing activities | 6.50 | 27.89 | 9313.17 | 4.26 | 53.36 | 40.91 | 12.45 | 39.99 |

Table A.1 – (Cont.)

| SECTOR DESCRIPTION | ROA | AGE | SIZE (TA) | GROWTH | TD | STD | LTD | EXP_INT |
|--|------|-------|-----------|--------|-------|-------|-------|---------|
| 33 - Repair, maintenance and installation of machinery and equipment | 6.69 | 24.61 | 18626.27 | 4.23 | 62.69 | 52.45 | 10.24 | 23.23 |
| Total | 3.93 | 28.83 | 20001.08 | 6.33 | 58.70 | 42.52 | 16.18 | 44.29 |

Source: Own elaboration using SABI and Stata estimations| Size and age are in expressed in logarithms. All explanatory variables are lagged one year.